



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/680,354	10/07/2003	Richard J. Monro	00700-P0052B	5641
24126	7590	10/01/2004	EXAMINER	
ST. ONGE STEWARD JOHNSTON & REENS, LLC			CLARKE, SARA SACHIE	
986 BEDFORD STREET			ART UNIT	
STAMFORD, CT 06905-5619			PAPER NUMBER	
			3749	

DATE MAILED: 10/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/680,354	MONRO, RICHARD J.	
	Examiner	Art Unit	
	Sara Clarke	3749	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### ***Drawings***

The drawings are objected to because in Fig. 5 "CFA" should be "OFA." See page 19 of the specification.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will

be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance. See 37 CFR 1.85.

### ***Specification***

Paragraph 0051 on page 21 of the specification should be amended to include the information from the related application.

### ***Claim Objections***

Claims 1-12 and 14 are objected to because of the following informalities: In claim 1 and 2, "pollution component" and "pollutant component" appear to be used interchangeably. For ease of understanding, the claims should be amended so that only one or the other is used. In claims 4 and 14, "to" should follow "in order." In claim 5, line 3, "a" should precede "secondary." Appropriate correction is required.

### ***1.105 Requirement***

Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.

The Power Engineering article (August 13, 2001) cited in this office action, second paragraph, relates to technology developed by the same assignee (RJM) as the current application. In the second paragraph, the article mentions a layered technology that achieves a 52% reduction in baseline emissions at a power plant owned by a third party.

To achieve the 52% reduction, were any burner modifications made in the power plant as claimed in the current application? To achieve the 52% reduction, were any

burner modifications made in the power plant as disclosed in the current application?

To achieve the 52% reduction, were any burner modifications made in the power plant?

To achieve the 52% reduction, was overfire air used in the power plant as claimed in the current application? To achieve the 52% reduction, was overfire air used in the power plant as disclosed in the current application? To achieve the 52% reduction, was overfire air used in the power plant?

To achieve the 52% reduction, was SNCR used in the power plant as claimed in the current application? To achieve the 52% reduction, was overfire air used in the power plant as disclosed in the current application? To achieve the 52% reduction, was SNCR used in the power plant?

To achieve the 52% reduction, was targeted chemical injection of NO<sub>x</sub> reducing agents used in the power plant as claimed in the current application? To achieve the 52% reduction, was targeted chemical injection of NO<sub>x</sub> reducing agents used in the power plant as disclosed in the current application? To achieve the 52% reduction, was targeted chemical injection of NO<sub>x</sub> reducing agents used in the power plant?

Was the installation of layered technology in the Austin Electric power plant a part of a sale? If the answer to the previous question was no, why was the layered technology installed in the power plant of Austin Electric? Was the installation of layered technology in the Austin Electric power plant a public use of the layered technology?

Lastly, was the combustion tempering used the same as disclosed and/or claimed in the current application?

The fee and certification requirements of 37 CFR 1.97 are waived for those documents submitted in reply to this requirement. This waiver extends only to those documents within the scope of this requirement under 37 CFR 1.105 that are included in the applicant's first complete communication responding to this requirement. Any supplemental replies subsequent to the first communication responding to this requirement and any information disclosures beyond the scope of this requirement under 37 CFR 1.105 are subject to the fee and certification requirements of 37 CFR 1.97.

The applicant is reminded that the reply to this requirement must be made with candor and good faith under 37 CFR 1.56. Where the applicant does not have or cannot readily obtain an item of required information, a statement that the item is unknown or cannot be readily obtained will be accepted as a complete reply to the requirement for that item.

This requirement is an attachment of the enclosed Office action. A complete reply to the enclosed Office action must include a complete reply to this requirement. The time period for reply to this requirement coincides with the time period for reply to the enclosed Office action.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-5, 8-12, 25, 27-29, 32, and 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Power Engineering article (August 13, 2001), Monroe (US 5131334), Lissianski et al. (US 6280695), Monroe et al. (US 5690039), and Grethe et al. (US 4644879).

The Power Engineering article teaches using a layered technology approach to NO<sub>x</sub> reduction for utility and industrial boilers without resorting to costly low NO<sub>x</sub> burners or SCRs.

Monro '334 discloses a modified burner for use in a utility boiler modified to provide a stable flame throughout load variations and to reduce NO<sub>x</sub> by reducing the peak flame temperature. See columns 2 and 3.

Lissianski et al. discloses a method of reducing NO<sub>x</sub> emissions from combustion systems, including boilers, by providing overfire air (OFA) together with a reagent (SNCR) into the flue gases. See column 1

Monro et al. '039 discloses a method and apparatus for reducing NO<sub>x</sub> emissions from boilers by tempering. See applicant's specification, page 20, paragraph 0049.

Grethe discloses a method and apparatus for a targeted chemical injection system for the purpose of reducing pollutant emissions by spraying into the combustion zone through the turbulent zone (see Fig. 1) an aqueous suspension including a reagent to bind the pollutant.

Thus, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to provide a system including a modified burner, OFA, a tempering system, an SNCR system, and a targeted chemical injection system as taught by Monroe '334, Lissianski et al., Monroe et al., and Grethe because the Power Engineering Article

teaches that layering different technologies is advantageous to reduce emissions without resorting to costly low NO<sub>x</sub> burners or SCRs.

Claims 2 and 26 rejected under 35 U.S.C. 103(a) as being unpatentable Power Engineering article (August 13, 2001), Monro (US 5131334), Lissianski et al. (US 6280695), Monro et al. (US 5690039), and Grethe et al. (US 4644879). (US 4644879) as applied to claims 1 and 25 above, and further in view of Bool, III et al. (US 6254379).

The Power Engineering article, Monro '334, Lissianski et al., Monro et al. '039, and Grethe et al. disclose the invention substantially as claimed with the exception of the targeted chemical injection system does not reduce NO<sub>x</sub>.

Bool, III et al. discloses a combustion system and teaches the use of providing urea for targeted into the injection zone for the purpose of reducing NO<sub>x</sub>. See columns 1 and 2.

Thus, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to provide the system of the Power Engineering article, Monro '334, Lissianski et al., Monro et al. '039, and Grethe et al. with urea as the chemical in the targeted chemical injection system as taught by Bool, III for the purpose of reducing NO<sub>x</sub>.

Claims 6 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable Power Engineering article (August 13, 2001), Monro (US 5131334), Lissianski et al. (US 6280695), Monro et al. (US 5690039), and Grethe et al. (US 4644879). (US 4644879) as applied to claims 1 and 25 above, and further in view of Garcia-Mallof (US 5727480).



The Power Engineering article, Monro '334, Lissianski et al., Monro et al. '039, and Grethe et al. disclose the invention substantially as claimed with the exception of selecting the velocity of the OFA to substantially complete combustion.

Garcia-Mallol discloses a combustion system and teaches the use of selecting the velocity of the OFA to substantially complete combustion. See column 4, first full paragraph.

Thus, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to provide the system of the Power Engineering article, Monro '334, Lissianski et al., Monro et al. '039, and Grethe et al. with selecting the velocity of the OFA as taught by Garcia-Mallol for the purpose of substantially completing combustion.

Claims 7 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable Power Engineering article (August 13, 2001), Monro (US 5131334), Lissianski et al. (US 6280695), Monro et al. (US 5690039), and Grethe et al. (US 4644879) as applied to claims 1 and 25 above, and further in view of Hardgrove (US 3048131).

The Power Engineering article, Monro '334, Lissianski et al., Monro et al. '039, and Grethe et al. disclose the invention substantially as claimed with the exception of the claimed percentage ranges of primary air and secondary OFA.

Hardgrove discloses a combustion system and teaches the use of primary air in the range of 90-95% and secondary OFA at 17% to reduce emissions of NO<sub>x</sub>. See the top of column 6.

Thus, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to provide the system of the Power Engineering article, Monro

'334, Lissianski et al., Monroe et al. '039, and Grethe et al. with the percentages of primary air and secondary OFA taught by Hardgrove for the purpose of reducing emissions of NO<sub>x</sub>.

Claims 13-15, 17-19, 37-39, and 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Power Engineering article (August 13, 2001), Monroe (US 5131334), Lissianski et al. (US 6280695), Monroe et al. (US 5690039), and Grethe et al. (US 4644879). (US 4644879), Bool, III et al. (US 6254379), and Garcia-Mallol (US 5727480).

The Power Engineering article, Monroe '334, Lissianski et al., Monroe et al. '039, and Grethe et al. disclose the invention substantially as claimed with the exception of the targeted chemical injection system does not reduce NO<sub>x</sub> and selecting the velocity of the OFA to substantially complete combustion.

Bool, III et al. discloses a combustion system and teaches the use of providing urea for targeted into the injection zone for the purpose of reducing NO<sub>x</sub>. See columns 1 and 2.

Garcia-Mallol discloses a combustion system and teaches the use of selecting the velocity of the OFA to substantially complete combustion. See column 4, first full paragraph.

Thus, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to provide the system of the Power Engineering article, Monroe '334, Lissianski et al., Monroe et al. '039, and Grethe et al. with urea as the chemical in the targeted chemical injection system as taught by Bool, III for the purpose of reducing

NO<sub>x</sub> and with selecting the velocity of the OFA as taught by Garcia-Mallol for the purpose of substantially completing combustion.

Claims 16 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable Power Engineering article (August 13, 2001), Monroe (US 5131334), Lissianski et al. (US 6280695), Monroe et al. (US 5690039), Grethe et al. (US 4644879), Bool, III, and Garcia-Mallol as applied to claims 13 and 37 above, and further in view of Hardgrove (US 3048131).

The Power Engineering article, Monroe '334, Lissianski et al., Monroe et al. '039, Grethe et al., Bool, III, and Garcia-Mallol disclose the invention substantially as claimed with the exception of the claimed percentage ranges of primary air and secondary OFA.

Hardgrove discloses a combustion system and teaches the use of primary air in the range of 90-95% and secondary OFA at 17% to reduce emissions of NO<sub>x</sub>. See the top of column 6.

Thus, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to provide the system of the Power Engineering article, Monroe '334, Lissianski et al., Monroe et al. '039, Grethe et al., Bool, III, and Garcia-Mallol with the percentages of primary air and secondary OFA taught by Hardgrove for the purpose of reducing emissions of NO<sub>x</sub>.

Claims 20-22, 24, 44, 45, 46, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable Power Engineering article (August 13, 2001), Monroe (US 5131334), Garcia-Mallol (US 5727480), and Monroe et al. (US 5690039).

Monro '334 discloses a modified burner for use is a utility boiler modified to provide a stable flame throughout load variations and to reduce NO<sub>x</sub> by reducing the peak flame temperature. See columns 2 and 3.

Garcia-Mallol discloses a combustion system and teaches the use of selecting the velocity of the OFA to substantially complete combustion. See column 4, first full paragraph.

Monro et al. '039 discloses a method and apparatus for reducing NO<sub>x</sub> emissions from boilers by tempering. See applicant's specification, page 20, paragraph 0049.

Thus, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to provide a system including a modified burner, over fire air, a tempering system, as taught by Monro '334, Garcia-Mallol, and Monro et al. because the Power Engineering Article teaches that layering different technologies is advantageous to reduce emissions without resorting to costly low NO<sub>x</sub> burners or SCRs.

Claims 23 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable Power Engineering article (August 13, 2001), Monro (US 5131334), Garcia-Mallol (US 5727480), and Monro et al. (US 5690039), as applied to claims 20 and 44 above, and further in view of Hardgrove (US 3048131).

The Power Engineering article, Monro '334, Garcia-Mallol, and Monro et al. '039, disclose the invention substantially as claimed with the exception of the claimed percentage ranges of primary air and secondary OFA.

Hardgrove discloses a combustion system and teaches the use of primary air in the range of 90-95% and secondary OFA at 17% to reduce emissions of NO<sub>x</sub>. See the top of column 6.

Thus, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to provide the system of the Power Engineering article, Monro '334, Garcia-Mallol, and Monro et al. '039 with the percentages of primary air and secondary OFA taught by Hardgrove for the purpose of reducing emissions of NO<sub>x</sub>.

With regard to claims 10, 11, 18, 34, 35, and 42, it has been held that when claims ranges "overlap or lie inside ranges disclosed by the prior art a *prima facie* case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976) and MPEP 2144.05. Lissianski et al. discloses a range of 1600-2000° F. Thus, since the claimed ranges overlap or lie inside the ranges disclosed by Lissianski et al. to have used the claimed ranges would have been obvious to one of ordinary skill in the art at the time of applicant's invention.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kobayashi et al. (US 2003/0099912 A1) and Donais et al. (US 5626085) disclose various systems for NO<sub>x</sub> reduction.

### ***Contact Information***

Any inquiry concerning this or earlier communications from the examiner should be directed to Sara Clarke whose phone number is 703-308-1388. The examiner normally can be reached Mon-Fri, 8:30-1:00.

If attempts to reach the examiner by phone are unsuccessful, the examiner's supervisor, Ira Lazarus can be reached at 703-308-1935. The fax number for the organization where this application is assigned is 703-872-9306.

Status information for an application is available from the Patent Application Information Retrieval (PAIR) system. Status information for published applications is available from Private or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about PAIR, see <http://pair-direct.uspto.gov>. For questions on access to Private PAIR, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sara Clarke  
Primary Examiner  
Art Unit 3749

September 27, 2004

*Noted &  
Approved  
Ira S. Lazarus*

Ira S. Lazarus  
Supervisory Patent Examiner  
Group 3700